ATTACHMENT A

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1-65. (Cancelled)

66. (New) A method of making a balance spring for use in a horological or other precision instrument, comprising the steps of winding a length of non-magnetic balance spring material formed of continuous fibers or of a ceramic, around a cylindrical former, using a releasing agent to inhibit adjacent layers of the winding from adhering to each other or to facilitate release from each other should they become adhered, and heat treating the wound balance spring material.

67. (New) A method according to claim 66, wherein after heat treating the assembly is sliced at intervals perpendicular to the rotational axis of the former, to form a plurality of spiral springs.

68. (New) A method according to claim 66, wherein the releasing agent is applied in vaporized particle form to the spring material.

69. (New) A method according to claim 66, wherein the releasing agent is in the form of a solid sheet of spacing material which is wound around the cylindrical former together with the length of the spring material so that adjacent layers of the spring material are separated by the spacing material.

70. (New) A method according to claim 66, wherein the releasing agent is PTFE, FEP or ETFE.

71. (New) A method according to claim 66, wherein the balance spring material is in the form of a sheet of continuous fiber material pre-impregnated with a matrix phase.

72. (New) A method according to claim 66, wherein the spring so formed is of flat Archimedes spiral form.

73. (New) A method of making a balance spring for use in a horological or other precision instrument, comprising the steps of placing a length of a non-magnetic balance spring material around, in or onto a receiving plate, former or mandrel, heat treating the balance spring material and removing it from the former, receiving plate or mandrel to form a flat Archimedes balance spring.

74. (New) A method according to claim 73, wherein the former, receiving plate or mandrel has channels for receiving the balance spring material.

75. (New) A method according to claim 73, wherein the former, receiving plate or mandrel is heated.

76. (New) A method according to claim 73, wherein the balance spring material is ceramic or a ceramic composite.

77. (New) A thermally compensating non-magnetic balance wheel for use in conjunction with a thermally stable non-magnetic balance spring in a mechanical oscillator system in a horological or other precision instrument, the balance wheel including components of two different thermal expansion, the components being arranged to give equipoise to the balance wheel and to cause a decrease in the moment of inertia of the balance wheel with an increase in temperature, wherein the decrease in the moment of inertia is arranged to compensate for changes in the elasticity of the balance spring caused by the increase in temperature.

78. (New) A balance wheel according to claim 77, wherein the components include a balance wheel arm having one or more cross members and a rim attached to or integral with said cross members.

79. (New) A balance wheel according to claim 78, wherein the cross member(s) is of a first material having a first coefficient of thermal expansion and the rim comprises concave segments of a second material having a second coefficient of thermal expansion greater than said first coefficient of thermal expansion.

80. (New) A balance wheel according to claim 78, wherein the balance wheel rim and cross member(s) are formed of a first material having a first coefficient of thermal expansion and the balance wheel further comprises two concave segments inside said rim, formed of a different material to said rim having a second coefficient of thermal expansion greater than said first coefficient of thermal expansion.

81. (New) A balance wheel according to claim 78, wherein the balance wheel rim is formed of a first material having a first coefficient of thermal expansion and two or more members formed of a second material having a second coefficient of thermal expansion greater than said first material are attached to said rim and extend inwardly therefrom.

82. (New) A balance wheel according to claim 78, wherein the cross member(s) is of a first material having a first coefficient of thermal expansion and the rim is of a second material having a second coefficient of thermal expansion less than the first coefficient of thermal expansion, such that the increase in temperature causes an increase in the cross member(s) length and radially inward deflection of the rim to cause the decrease in the moment of inertia of the balance wheel.

83. (New) A balance wheel according to claim 82, wherein there are at least two appendages to the rim in the form of non-magnetically sensitive timing weights.

84. (New) A balance wheel according to claim 82, wherein said second coefficient of thermal expansion is negative.

85. (New) A balance wheel according to claim 82, wherein said first coefficient of thermal expansion is less than $6x10^{-6}K^{-1}$.

86. (New) A balance wheel according to claim 82, wherein there are one or more appendages arranged on the cross member(s), said appendage(s) comprising a stem and an eccentric head on the stem, the stem being rotatably mounted in an aperture of the balance wheel such that it is rotatable about an axis parallel to the axis of rotation of the balance wheel, whereby the moment of inertia of the balance wheel can be fine tuned by turning of the eccentric head.

87. (New) A balance wheel according to claim 79, wherein the second coefficient of thermal expansion is positive and greater than said first coefficient of thermal expansion, such that said concave segments are arranged to extend further radially inward with the increase in temperature to cause the decrease in the moment of inertia of the balance wheel.

88. (New) A balance wheel according to claim 87, wherein there are a plurality of appendages to the concave segments in the form of non-magnetically sensitive timing weights.

89. (New) A balance wheel according to claim 22, wherein said first coefficient of thermal expansion is negative, such that the cross member length(s) decreases with the increase in temperature to cause the decrease in the moment of inertia of the balance wheel.

90. (New) A balance wheel assembly comprising:

a thermally compensating non-magnetic balance wheel for use in conjunction with a thermally stable non-magnetic balance spring in a mechanical oscillator system in a horological or other precision instrument, the balance wheel including components of two different materials having different coefficients of thermal expansion, the components being arranged to give equipoise to the balance wheel and to cause a

decrease in the moment of inertia of the balance wheel with an increase in temperature, wherein the decrease in the moment of inertia is arranged to compensate for changes in the elasticity of the balance spring caused by the increase in temperature; and

a balance staff formed integrally with the balance wheel.

91. (New) A balance wheel assembly according to claim 90, wherein the balance wheel and balance staff are formed of a ceramic material.

92. (New) A balance wheel assembly according to claim 90, wherein the balance staff is integrally formed with one or more cross members which are arranged to support the balance wheel rim.

93. (New) A method of forming a balance wheel assembly, the balance wheel assembly comprising:

a thermally compensating non-magnetic balance wheel for use in conjunction with a thermally stable non-magnetic balance spring in a mechanical oscillator system in a horological or other precision instrument, the balance wheel including components of two different materials having different coefficients of thermal expansion, the components being arranged to give equipoise to the balance wheel and to cause a decrease in the moment of inertia of the balance wheel with an increase in temperature, wherein the decrease in the moment of inertia is arranged to compensate for changes in the elasticity of the balance spring caused by the increase in temperature; and

a balance staff formed integrally with the balance wheel;

the method comprising attaching the balance staff and balance wheel together when they are in their green state and using a bonding or heat treatment process to secure them together.

94. (New) A mechanical oscillator system for use in a horological mechanism or other precision instrument, the system comprising a non-magnetic balance spring of flat spiral or helecoidal form and a non-magnetic balance wheel; the balance spring being formed of a ceramic material or a material comprising continuous fibers; the balance

wheel being formed of a material having a coefficient of thermal expansion of less that $6x10^{-6}K^{-1}$; and the balance wheel further comprising a plurality of non-magnetic poising or timing appendages for making adjustments to the moment of inertia of the balance wheel.

95. (New) A mechanical oscillator system according to claim 94, wherein the appendages are arranged to give equipoise to the balance wheel.

96. (New) A mechanical oscillator system according to claim 94, wherein one or more of the appendages is an adjustment member comprising a stem and an eccentric head on the stem, the stem being rotatably mounted in an aperture of the balance wheel such that it is rotatable in the elasticity of the balance spring increase in temperature; and a balance staff formed integrally with the balance wheel caused by the balance wheel, whereby the moment of inertia of the balance wheel can be fine tuned by turning of the eccentric head.

97. (New) A mechanical oscillator system according to claim 94 having a balance wheel assembly comprising:

a thermally compensating non-magnetic balance wheel for use in conjunction with a thermally stable non-magnetic balance spring in a mechanical oscillator system in a horological or other precision instrument, the balance wheel including components of two different materials having different coefficients of thermal expansion, the components being arranged to give equipoise to the balance wheel and to cause a decrease in the moment of inertia of the balance wheel with an increase in temperature, wherein the decrease in the moment of inertia is arranged to compensate for changes in the elasticity of the balance spring caused by the increase in temperature; and

a balance staff formed integrally with the balance wheel.